

AMENDMENTS TO THE CLAIMS

The following listing of claims replaces all prior versions of claims in the application.

1. (Currently Amended) A method of separating ~~and purifying~~ a negatively charged target biopolymer from other biopolymers which are not negatively charged or which are larger than said target biopolymer among biological samples, comprising the steps of:

partitioning ~~between~~ a first solution, containing said target biopolymer and other biopolymers biological samples, and a second solution, for preserving separated ~~and purified~~ ~~biopolymers~~ target biopolymer, with the use of a [[gel]] partition;

~~movement of moving~~ said target biopolymer from within said first solution through said [[gel]] partition into said second solution using electrophoresis; and

~~separation and purification of~~ separating said target biopolymer from said second solution,

wherein said partition is a gel, a pillar array or a porous filter,

wherein said target biopolymer is a nucleic acid or protein, and

wherein said other biopolymers are nucleic acids and/or proteins.

2. (Currently Amended) ~~The biopolymer separation and purification method of claim 1, comprising the steps of:~~ A method of separating a negatively charged target biopolymer from other biopolymers which are smaller than said target biopolymer, comprising the steps of:

partitioning ~~among said~~ a first solution, containing said target biopolymer and said other biopolymers, [[said]] a second solution, for preserving said other biopolymers, and a third solution, for preserving said target biopolymer, biopolymers from each other with the use of said

gel a partition in three directions;

moving said other biopolymers from within said first solution through said partition and into said second solution,

~~movement of moving~~ said target biopolymer, ~~which has been moved~~ from within said first solution ~~[[to]]~~ into said ~~[[gel]]~~ partition using electrophoresis, then

moving said target biopolymer from within said partition into said second solution or said third solution using electrophoresis; and

~~separation and purification of~~ separating said target biopolymer from said third solution,

wherein said target biopolymer is a nucleic acid or protein, and

wherein said other biopolymers are nucleic acids and/or proteins.

3. (Currently Amended) The biopolymer separation ~~and purification~~ method of ~~claim 1 or claim 2~~, wherein said partition is a gel, a ~~very small~~ pillar array or a porous filter ~~is used as said gel~~.

4. (Withdrawn/Currently Amended) A biopolymer separation ~~and purification~~ apparatus, wherein a negatively charged target biopolymer is separated ~~and purified~~ from among biological samples, comprising:

a first solution containing said biological samples;

a second solution for preserving separated ~~and purified~~ biopolymers;

an electrophoresis container carrying a ~~[[gel]]~~ partition to partition said first solution from said second solution;

positive and negative electrodes provided to move said negatively charged biopolymer from within said first solution through said ~~[[gel]]~~ partition into said second solution using electrophoresis; and

a power supply for applying positive and negative voltages to said positive and negative electrodes respectively,

wherein biopolymer separation ~~and purification~~ can be performed by applying voltages to said electrodes and moving said target biopolymer from within said first solution through said ~~[[gel]]~~ partition to said second solution.

5. (Withdrawn/Currently Amended) The biopolymer separation ~~and purification~~ apparatus of claim 4, wherein a third solution is carried in said container in order to contact said ~~[[gel]]~~ partition in a direction different from directions of said first solution and said second solution and to preserve said biopolymer moved through said ~~[[gel]]~~ partition, comprising:

positive and negative electrodes for electrophoresis which are provided to move said negatively charged biopolymer from said ~~[[gel]]~~ partition into said third solution using electrophoresis; and

a power supply for applying positive and negative voltages to said positive and negative electrodes respectively,

wherein biopolymer separation ~~and purification~~ can be performed by moving said target biopolymer into said second or third chamber through the switching of movement directions caused by electrophoresis.

6. (Withdrawn/Currently Amended) The biopolymer separation ~~and purification~~ apparatus of claim 4 or claim 5, wherein said partition is a gel, a ~~very small~~ pillar array or a porous filter is ~~used as said gel~~.

7. (Currently Amended) A biopolymer separation ~~and purification~~ method, wherein a negatively charged target biopolymer fixed to a magnetic bead is separated ~~and purified~~ from other biopolymers among biological samples, comprising the steps of:

partitioning ~~[[of]]~~ a first solution, containing said target biopolymer fixed to said magnetic bead and said other biopolymers biological samples, a second solution, for preserving separated ~~and purified~~ other biopolymers, and a third solution, for preserving ~~[[a]]~~ said separated ~~and purified~~ target biopolymer fixed to ~~[[a]]~~ said magnetic bead, from each other with the use of a ~~[[gel]]~~ partition;

~~movement of~~ moving said target biopolymer fixed to said magnetic bead and said other biopolymers from within said first solution into ~~through~~ said ~~[[gel]]~~ partition into said second solution using electrophoresis;

~~movement of~~ while said target biopolymer fixed to said magnetic bead and said other biopolymers are in said partition, moving said target biopolymer fixed to ~~[[a]]~~ said magnetic bead, ~~which is in transit in said gel~~, into said third solution using magnetophoresis; and

~~separation and purification of~~ separating said target biopolymer fixed to said magnetic bead from said third solution.

wherein said target biopolymer is a nucleic acid or protein, and

wherein said other biopolymers are nucleic acids and/or proteins.

8. (Currently Amended) The biopolymer separation ~~and purification~~ method of claim 7, wherein said partition is a gel, a very small pillar array or a porous filter is used as said gel.

9. (Withdrawn/Currently Amended) A biopolymer separation ~~and purification~~ apparatus, wherein a negatively charged target biopolymer fixed to a magnetic bead is separated ~~and purified~~ from among biological samples, comprising:

a first solution containing said biological samples;

a second solution for preserving separated ~~and purified~~ biopolymers;

a third solution for preserving a separated ~~and purified~~ target biopolymer fixed to a magnetic bead;

a container carrying a ~~[[gel]]~~ partition to partition these three solutions from each other;

positive and negative electrodes provided in said container to move negatively charged biopolymers from within said first solution into said ~~[[gel]]~~ partition and said second solution using electrophoresis;

a power supply to apply positive and negative voltages to said positive and negative electrodes respectively; and

a magnetic field generation means wherein a magnetic field is generated in order to move said target biopolymer fixed to a magnetic bead, which is in transit in said ~~[[gel]]~~ partition using

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electrophoresis, into said third solution using magnetophoresis,

wherein biopolymer separation ~~and purification~~ can be performed by moving said target biopolymer fixed to a magnetic bead into said third solution using electrophoresis and magnetophoresis.

10. (Withdrawn/Currently Amended) The biopolymer separation ~~and purification~~ apparatus of claim 9, wherein said partition is a gel, a ~~very small~~ pillar array or a porous filter ~~is used as said~~ gel.

11. (Withdrawn/Currently Amended) The biopolymer separation ~~and purification~~ apparatus of claim 9 or claim 10, wherein an electromagnet, an electromagnetic coil, or a permanent magnet is used as said magnetic field generation means.